



Blue Tiger (Tirumala hamata)

METAMORPHOSIS

AUSTRALIA

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

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Membership fees are \$30 for individuals, schools, and organizations.

AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st June issue – May 1st

September issue – August 1st December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

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COVER PHOTO

Blue Tiger (*Tirumala hamata*) – Photo Todd Burrows

In Issue No. 96 March 2020, the cover image of the Peppermint Stick Insect that was credited to Todd Burrows is actually that of Jessa Thurman.



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FROM THE PRESIDENT

At our meeting on February 15th last, members present voted to make Frank Jordan a life member of our club. Frank was a foundation member of the club and actively participated in its meetings and excursions for many years. He often led these excursions and was an engaging and entertaining person to have there. Bringing a scientific knowledge base to meetings and discussions, he was always reading up on butterflies and other nature and had a wealth of knowledge, sharing this by writing quite a few articles for our newsletter/magazine over the years. Often by himself, he staffed many stalls, especially at monthly BCC Green Heart Fairs, making a big difference to BOIC's public profile. Together with Helen Schwencke, Frank wrote and published in 2005 the popular book "Create More Butterflies".

Following that same meeting, Richard Bull gave a very well received talk on the life cycle of the Richmond Birdwing butterfly (*Ornithoptera richmondia*) and of quite successful efforts to establish improved habitats for this butterfly. This talk prompted us to organize a well patronized excursion to Mount Tamborine four weeks later. You will find a report on this trip written by Peter Storer for this edition.

What an amazing three months we have had with an explosion of the number of species and actual numbers of butterflies, moths and other invertebrates. I am reminded again of the resilience of our native plants and creatures in facing the extremes of drought and of their ability to bounce back when the rains inevitably return. Todd Burrows took the time to record his observations of part of this phenomenon as you will read in our cover story.

As you read the other articles in this edition, I am sure you will endorse my sincere vote of thanks to all of our contributors.

Best wishes *Ross*

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My Backyard Butterfly Bonanza – Todd Burrows

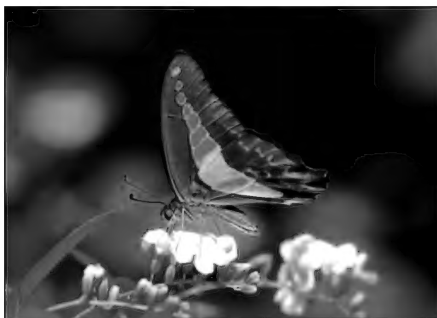
I've had an interest in the natural world from early childhood which grew over the years into a passion for birds. It wasn't until I got seriously into digital photography in 2008, while I was working as an Environment Officer at Couran Cove on South Stradbroke Island, that a keen interest in butterflies developed.

Flash forward to September 2019 and I finally settle on my first property, a quarter acre in the Gold Coast suburbs with some magnificent big eucalypts in the backyard and a disturbed creek in a narrow council reserve down the back. With the exceptionally dry weather that persisted over the next 5 months there was barely a butterfly to be seen. The December Richmond Birdwing butterfly (*Ornithoptera richmondia*) boom produced a couple of flyover sightings, which was very exciting and gave me hope the vines I am growing will attract this species one day.

Then, finally, in January the rain came and was followed up with more decent downpours. Plants burst back into life and the large weedy *Duranta* bushes I had earmarked for destruction began producing copious amounts of white flowers. The butterfly bonanza had begun! For the first 5-6 weeks it was the Lemon Migrant (*Catopsilia pomona*) that dominated the counts but the Blue Triangle (*Graphium choredon*) also featured in good numbers along with Orange Palm-dart (*Cephenes augiades sperthias*), Common Crow (*Euploea corinna*), Blue Tiger (*Tirumala hamata*) and Large Purple Line-blue (*Nacaduba berenice*). A highlight in these early stages was a regular visit from the Narrow-winged Awl (*Badamia exclamationis*), a new species for me.



Lemon Migrant (*Catopsilia pomona*)



Blue Triangle (*Graphium choredon*)

Any chance I had when the sun was out, I'd be standing near the *Duranta* bushes making a list on the Butterflies Australia app and photographing which ever species I could. My backyard list was growing quickly with additions of Yellow Albatross (*Appias paulina ega*), Large Grass-yellow (*Eurema hecabe*), Varied Eggfly (*Hypolimnys bolina nerina*), Swamp Tiger (*Danaus affinis*), Hairy Line-blue



(*Erysichton lineata*), Bright Cornelian (*Deudorix diovis*), and Indigo Flash (*Rapala varuna simsoni*). Not all species were interested in the flowers and for some I had to make do with flyby views including the Bordered Rustic (*Cupha prosope*), Purple Crow (*Euploea tulliolus*), Scarlet Jezebel (*Delias argenthona*) and Australian Leafwing (*Doleschallia bisaltide*). At the peak of the diversity in early March, I was getting daily counts of up to 30 species!

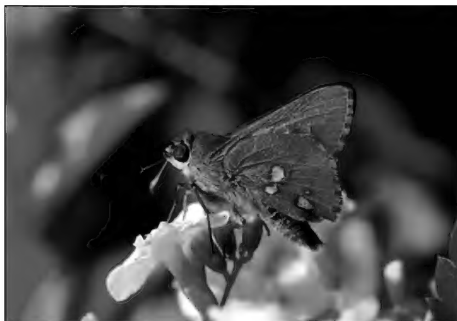


Yellow Albatross (*Appias paulina ega*)



Varied Eggfly (*Hypolimnys bolina nerina*)

As the butterfly season progressed I was seeing more new species for the yard including Dainty Swallowtail (*Papilio anactus*), Northern Silver Ochre (*Trapezites maheta*), Lilac Grass-skipper (*Toxidia doubledayi*), Dingy Grass-skipper (*Toxidia peron*), Southern Pearl-white (*Elodina angulipennis*), White Migrant (*Catopsilia pyranthe crokera*), Pinkish Grass-yellow (*Eurema herla*), White-banded Plane (*Phaedyra shepherdii*), Purple Cerulean (*Jamides phaseli*), Spotted Pea-blue (*Euchrysops cnejus cnidus*) and Dainty Grass-blue (*Zizula hylax attenuata*) amongst others. A few Pale Ciliate-blue (*Anthene lycaenoides*) were another new species for me. The current species tally for the backyard is now 63 and in the last month the Blue Tiger has dominated. The tigers are still flying past the house in good numbers heading north (1/5/20).



Northern Silver Ochre (*Trapezites maheta*)



Purple Cerulean (*Jamides phaseli*)



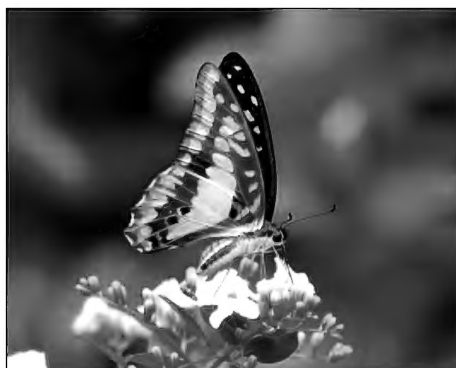
My plan for the property is to gradually replace the large patch of *Duranta* with native butterfly nectar plants and to increase the variety of host plants, such that the butterfly bonanza may continue for many years to come!



Bright Cornelian (*Deudorix diovis*)



Dainty Grass-blue (*Zizula hylax attenuata*)



Pale Triangle (*Graphium eurypylus*)



Splendid Ochre (*Trapezites symmomus*)



Lesser Wanderer (*Danaus petilia*)



Meadow Argus (*Junonia villida calybe*)

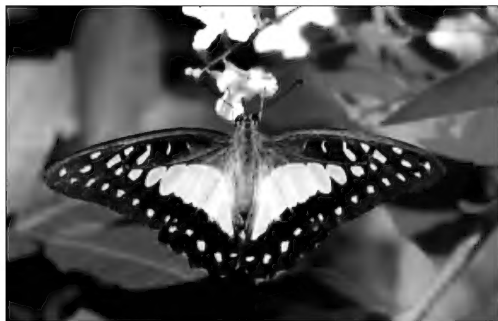




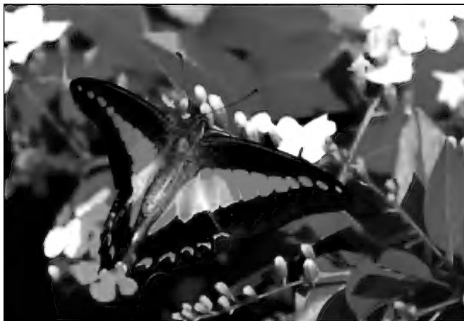
Narrow-winged Awl (*Badamia exclamationis*)



Pinkish Grass-yellow (*Eurema herla*)



Pale Triangle (*Graphium eurypylus lycaon*)



Blue Triangle (*Graphium choredon*)



Hairy Line-blue (*Erysichton lineata*)



Large Grass-yellow (*Eurema hecabe*)

Photos Todd Burrows

<https://www.flickr.com/photos/toddburrows/>



Insects of New Guinea – Jessa Thurman



Jessa at one of her picturesque locations

If you had told me I would get to live on a ship for one month, sailing around the island of New Guinea, and working as a wildlife guide, I would never have believed you. And yet, this is exactly what I got to do in October 2019. Heritage Expeditions is a small ecotourism company based in New Zealand, and each year they take people to the most remote regions of the world. Onboard their small expedition vessel, I joined a team of naturalists and a Russian crew,

and together we took passengers through the vibrant islands of West Papua, Papua New Guinea, Bougainville, and the Solomon Islands. Each day we explored a new place - a coral cay, a rainforest, a mine-site being reclaimed by nature, and along the way I took my new camera and attempted to document this dream as best as I could.



At the site of Panguna Mine
Bougainville

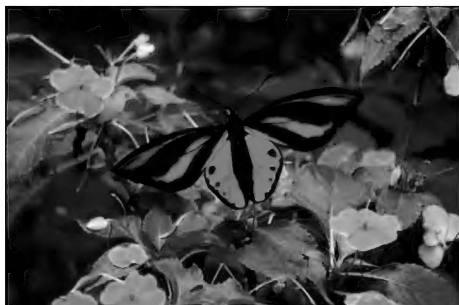


Bougainville Blues (*O. priamus urvillianeus*)

We sought out Birds of Paradise first, enjoying sightings of Wilson's Bird of Paradise with its strange bald blue head and the dancing Red Birds of Paradise with their display for inquiring females. But along these travels, we entered misty-mountains and found many of the wonderful Birdwings of Paradise. We have a few of these wonders here too. There are three species of Birdwing butterflies (*Ornithoptera* spp.) known from Australia (*O. euphorion*, *O. richmondia*, and *O. priamus*). The last of these is shared with New Guinea and is only found in the northernmost regions of Queensland. *Ornithoptera priamus* is common in New Guinea however, and in some



spectacular company, with eleven species of Birdwing butterflies occurring in this region.



Tithonus Birdwing (*O. tithonus*)

These butterflies rival the Birds of Paradise in their strange beauty, sexual dimorphism, and male dances for females. You can glimpse this display in my photo of the Bougainville Blues (*O. priamus urvillianeus*), with the bright blue male hovering above a feeding female. Other stunning males of this group which we encountered include the Tithonus Birdwing (*O. tithonus*) of the Arfak Mountains. The green color on this butterfly's wings is

a reflection from its scales, which, at the right angle, can also appear golden yellow. While the males are flashy with color, the more simply colored females rule for size. Females of the Queen Alexandra's Birdwing (*O. alexandrae*) are the largest butterflies in the world.

However, what I found most surprising along my travels were the people. Everywhere we went, I got to meet someone new. These were most typically other young women, either curious to see what had brought me here, or wondering what I had found to make me start shouting. The most exciting finds were stick insects and I was first drawn to New Guinea out of curiosity for the sister-species of the Peppermint stick insects (*Megacrania batesii*) which we have here in Australia. The most striking of these were the black Peppermints (*Megacrania nigrosulfurea*) of New Britain, alongside other members of *M. batesii* in New Ireland, Papua New Guinea. When these were found, locals were confused by my excitement, but were then entertained and happy to help find others.

It was with such company that I found myself walking along a forest path. They were excited to find something and interested in what I may find for them. Soon enough, I spotted a small black insect, which upon closer inspection was identified as a newly hatched Leaf insect (*Phyllium* sp.). I was beside myself with excitement, as I had previously thought I would never find such a cryptic insect! The girls who had joined me just laughed and looked concerned at my joy for finding such a small speck of a creature. Moments after this, we



spotted something enormous in a palm lily (*Cordyline* sp.): the Spiny Devil (*Eurycantha* sp.)! Again, something I had only dreamed of finding was suddenly before me. I was quick to try and share this amazing insect with some of the locals, letting it first crawl onto my arm and showing them it was safe. But the boys were quite terrified by what I had to offer. The girls on the other hand were brave and with some caution, held the stick insects. Previously worried by the spines along the body of the creature, they seemed to come to enjoy the animal, and the boys were only left in awe by these brave girls.

Although my visit to each place was brief, I hope to return to this region and explore what other insects it has to offer. I also dream of meeting some of my friends again, seeing how they've grown, and finding out if they have a new view of insects. I can only hope these remarkable experiences have had as equal of a positive impression on the locals as it has had on me.

Note: This article has been modified and reprinted from an earlier version in the *News Bulletin* of the Entomological Society of Queensland (vol. 47, issue 8, pp. 160-61 and vol. 47, issue 9, pp. 184-187).

Photos Jessa Thurman

Observation Notes on *Haploscapanes australicus* (Arrow 1908) –

Richard Zietek

I first came into contact with this species in 1967 at Narangba north of Brisbane. A friend of mine had bought a 5 acre block of bush and we light trapped on the block one Friday night. A very large female and a small male *Liteupatorus australicus* (Arrow 1908) as it was called then, came to the mercury vapour light. I was not aware of the breeding habits of this species at that time. Since then I have collected and observed and bred this species now called *Haploscapanes australicus* at various sites, Toohey Forest and Mt Gravatt sites 1987 – 2000, Capalaba 2007 – 2020, and SW of Dalby 2015.

This species belongs to the Tribe Dynastini (MacLeay 1819) of which Australia has 2 Genera, *Xylotrupes* (Hope 1837) and *Haploscapanes* (Arrow 1908).

Xylotrupes: – 2 subspecies – *Xylotrupes australicus australicus* (Thompson, 1859) and *Xylotrupes australicus darwinia*. The first is the common rhino beetle of the East Coast of Australia, the second obviously from the Darwin area. *Xylotrupes* has previously been called *X. gideon australis* and lately *X. ulysses australis*.

Haploscapanes: – has 3 species *Haploscapanes australicus* (Arrow 1908), *Haploscapanes barbarossa* (Fabricius 1775), and *Haploscapanes inermis* (Prell 1911). *H. australicus* is found in mainly coastal Cen. Qld to Sth. N.S.W. *H. barbarossa* is found in Cairns and north Qld, NT and Nth W.A. The distribution of *H. inermis* is vague in Qld.



Male Dynastids have horns or appendages on the head and pronotum of some kind and in some species e.g. *Pseudoryctes* spp. quite bizarre ornamentations (see image *Pseudoryctes turritus*, male). The females do not have horns and in many cases are unknown to science. Males of most species are attracted to light, mercury vapour or ultra violet, but the females very rarely are. So does it seem obvious that males move about searching for females, while females are more sedentary?



Pseudoryctes turritus (male 2cm)

Haploscapanes australicus breed in very large old growth eucalypts. Species encountered have been *Eucalyptus planchoniana*, *Eucalyptus signata* and *Eucalyptus nigra*. Other species are probably utilised if they meet the following criterion, i.e. hollow core filled with decomposing termite nests. I trialled various organic and timber mulches and all failed to nourish the larvae, all dying of starvation. So I tried the material from the core of the tree and had instant success. This gave me the idea of crushing and grinding the termite nest material making my own medium.

The breeding colony can have up to 3 generations in various stages of development, at the base of the tree up to 1 metre down in the hollow (see images). The trees used can have a circumference of over 3 metres and have had a working colony of termites up the main core of the tree. As the termite nest disintegrates the material falls below onto existing medium, replenishing existing food supply. These colonies can exist for in excess of 12 years.

The larval stage takes a minimum of 2 years to pupate, providing there is rain during this time. In dry years the whole brood can go 3 years. A portion of larvae go 3 years regardless of conditions. These are usually larger individuals. Some large larvae come to the surface at night and during rain. These grubs may be preyed on by Carab beetles e.g. *Catadromus* spp. and other predators.

Larvae pupate late Nov./early Dec. and remain in their cocoons till late Feb./early March depending on rain to emerge. Males mate with females in the colony but also leave to search for other mates. They have a life span of approximately 6 weeks, females living longer than males.

The critical factor in these colonies is the layer of faecal pellets which are found below the larvae. These pellets are recycled as nutrition by the very young larvae. The pellets would be high in nutrients and have certain enzymes and bacteria necessary for digestion for the small larvae. Moisture is necessary not only for the small larvae but helps the pupated larvae to emerge. These larvae are only 3mm long, eggs 2mm and, if they do not have help with moisture, many perish as they cannot process the dry medium. Moisture is necessary for small larvae to get a growth spurt. (See image 9 month old larvae moist medium.)



Another observation that was noted was that generations cycled between male and female dominance i.e. one generation being 70-80% female and next generation being 70-80% male. It happened often enough to be noticed.

As with many insects, they have an inbuilt mechanism to survive drought periods, hence the slower, longer developing portion of the colony. In good years the larvae that take 3 years to develop can be larger specimens, while those that go 3 years in dry conditions are much smaller.

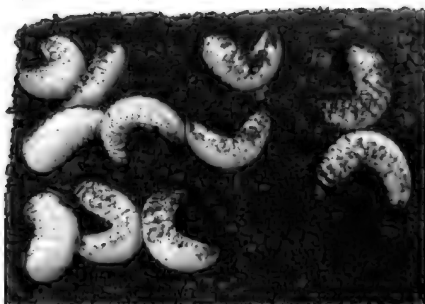
The trees that these beetles were colonising, 3 at Toohey Forest and 1 at Mt Gravatt, have been destroyed by fire since 2000.

This species can become a threatened species due to its small niche in the environment. Large hollow trees are the first cleared when a development goes ahead and, with climate warming, more bushfires mean more large hollow trees catching fire.

References:

Dechambre, Roger-Paul, 2005. The Beetles of the World Vol 30, Dynastidae - Australian and Oceanian

Slipinski Adam and Lawrence, John F., 2019. Australian Beetles Vol 2, CSIRO Publishing
Zoological Catalogue of Australia, Vol 9, 1992. Coleoptera Scarabaeoidea



9 month old larvae



Final instar (not full grown) and 12 month old larvae



Final instar larvae (2.5 yrs old)



Pupae of *Haploscapanes australicus*





Males sizing each other up



Hatching *Haploscapanes* adults

Photos Richard Zietek

Life history notes on the Lemon Migrant, *Catopsilia pomona* (Fabricius, 1775) Lepidoptera: Pieridae – Wesley Jenkinson



I thought it timely to write this article to coincide with the large numbers of adults flying in south-eastern Queensland during the recent summer of 2020. This has also been covered by several media reports and mentioned by many people.

This colourful, well-known butterfly is known sporadically from all states except for Tasmania. Within Queensland, it is chiefly located in coastal and subcoastal areas, along the Great Dividing Range and reaches further west. The mapped range in Braby 2000 has been considerably increased in Braby 2016 for adjacent areas in south-western Queensland. This is probably a result of more frequent reporting of observations, rather than the butterfly expanding its range. I

observed two adults flying in Charleville during October 2015.

Adult egg-laying is not restricted to any specific habitat but is more opportunistic as to where their host plants are established and they will commonly breed on trees in

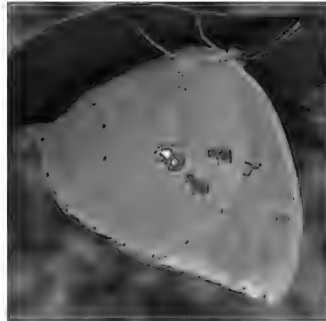
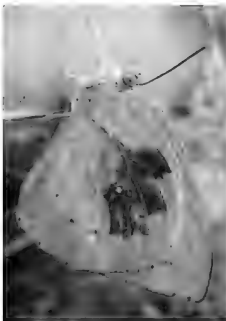


parks and suburban gardens. The adults are transitional breeders and will usually disperse from their host within a few days.

Migrations of varying numbers of thousands of this species are well-known. Adults fly rapidly around host trees and often settle on these or vegetation growing nearby. Males typically fly around the host trees in search of freshly emerging females. Quite often several males constantly follow the females during egg-laying in the prospect of mating. Even very old tatty females are constantly 'annoyed' by the males. During warmer months, males can be observed fluttering around the host trees at dawn. During daytime, flight occurs in both sunny and warm cloudy conditions. During the evening, the males may roost in small clusters below leaves of trees [pictured at right].



Although not covered in this article, adults of the White Migrant (*C. pyranthe*), Yellow Migrant (*C. gorgophone*) and Orange Migrant (*C. scylla*) all could potentially be confused by the unwary when identifying species in the *Catopsilia* family.



Female underside variations

Within this species individual specimens show a large variation in size and colour pattern, having two distinct seasonal forms: one, the so-called 'dark form' which is the wet (or summer) season form and the other so-called 'pale form' which is the dry (or winter) season form. Males of both forms show little variation whilst both forms of females illustrate quite a considerable array of patterns. Dark forms have black



antennae whilst pale forms have pink antennae. To add to the confusion, between seasons, both forms can be on the wing at the same time!

The sexes as pictured below show males and females which are relatively easy to separate, but it can be tricky to distinguish between the two in flight. The males also have a patch of whitish hairs along the underside of the forewing dorsum with a corresponding white sex brand along the radial sector on the upperside of the hindwing.

Adults of both sexes regularly feed on a broad range of native and exotic flowers. When feeding the wings generally remain closed.

Wingspans vary considerably between the 2 forms. On average, the dark form is slightly smaller than the pale form (Braby 2000). Wingspans for the typical dark form adults pictured are males 58mm and females 60mm respectively. Wingspans for the typical pale form adults pictured are males 62mm and females 64mm respectively. Some individuals may be a few millimetres larger than these sizes.



***Catopsilia pomona* (Lemon Migrant – Typical Dark Form)**

Images top left to right: male upperside, female upperside Images lower left to right: male underside, female underside



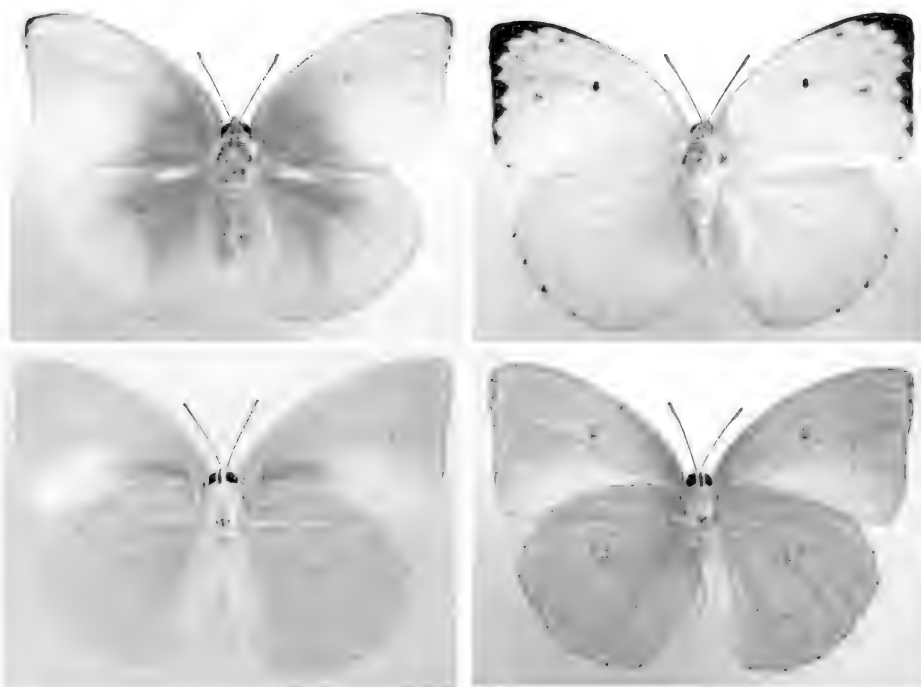


***Catopsilia pomona* (Lemon Migrant –Less common variants - Dark Form)**

Images top left to right: Variant dark form, male upperside, male underside

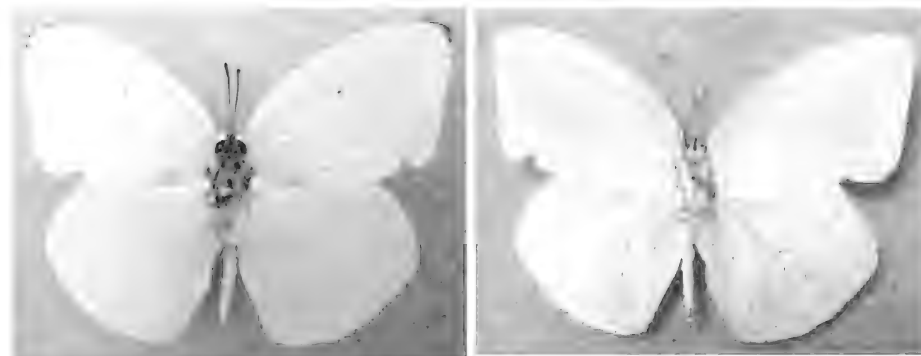
Remaining above images: Variant dark form 3 female uppersides and 1 female underside





***Catopsilia pomona* (Lemon Migrant – Typical Pale Form)**

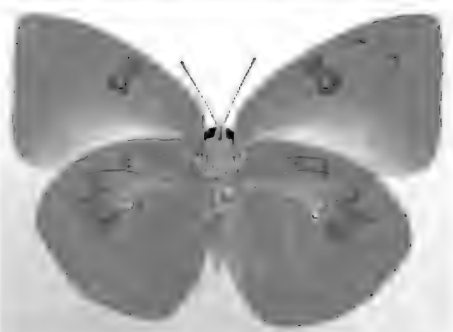
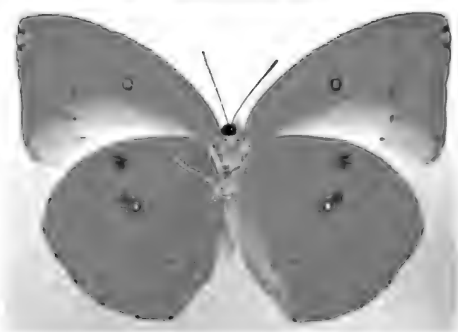
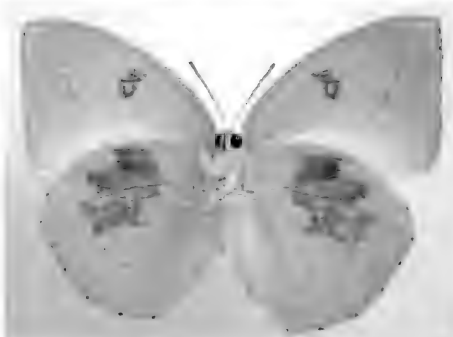
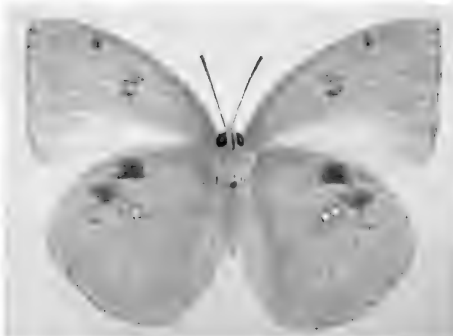
Images top left to right: male upperside, female upperside
 Images lower left to right: male underside, female underside



***Catopsilia pomona* (Lemon Migrant - Less common variants - Pale Form)**

Images above left to right: Variant pale form, male upperside, male underside
 (above images courtesy of John Moss)





***Catopsilia pomona* (Lemon Migrant - Less common variants - Pale Form)**

Remaining above images: Variant pale form female upperside and 5 female undersides

This butterfly utilises a number of host plants in the Caesalpiniaceae (*Cassia* and *Senna*) family. References to various species are given in Braby 2000 & 2016. For south-eastern Qld and northern NSW the cassias include three local native, one NQ native and three exotic locally cultivated species. As well, two native and three exotic *Senna* species have also been recorded as hosts for this butterfly. One of these three



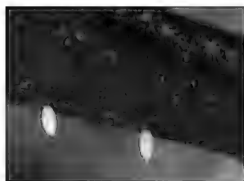
latter (*Senna didymobotrya*) seems not to be an ideal host plant, as it now appears that the butterfly larvae die in their early instars (P. Hendry pers. comm.). Importantly, I have also found the same result. It should be noted that some *Cassia* species are now listed as *Senna* in Moss 2010, 2019.

The life history is rather well known and has been documented by various authors in Common & Waterhouse (1972 & 1981), Braby (2000) etc.

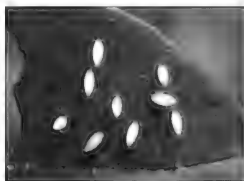


Mating pair

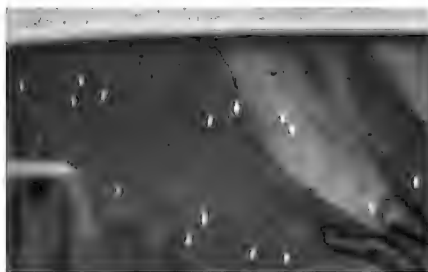
At Beaudesert during February 2010, a female was observed laying eggs on a cultivated *Cassia fistula* in my garden. It fluttered throughout the tree and then settled on a leaf with wings closed. The abdomen was curled onto the upperside on the leaf and a single egg was laid. This pattern was continued several times. Fresh shoots were favoured and mature leaves were also utilised. This observation was made at 10.30 am during slightly overcast conditions. During this period, possibly up to a dozen females were observed ovipositing on the same tree.



Eggs on semi-hardwood



Various eggs on section of leaf



Various eggs laid under one leaf

Eggs are laid singly but many eggs may be present on any given leaf being oviposited by several females. When leaves are in short supply females may also oviposit along stems or even branch semi hardwood. During mating the male carries the female. In cloudy conditions, I noted a pair in copulation for at least a period of 3 hours.

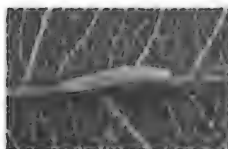


The eggs are white or pale yellow being approximately 1.5mm high x 0.6mm wide, spindle-shaped with slightly raised longitudinal ribs.

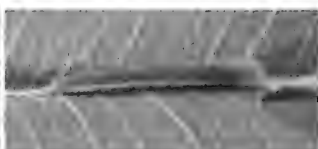
Larvae are usually found resting on the upperside of the host plant leaf along the midrib on a pad of fine silk. Sometimes two leaves may be stitched together as a resting pad on smaller leaved host plants. The first instars consume the eggshell soon after emergence. The larvae feed openly during the day or night, completing five instars. Whilst larvae were in great numbers on my *Cassia fistula*, at 8.00pm one night during late February 2020,



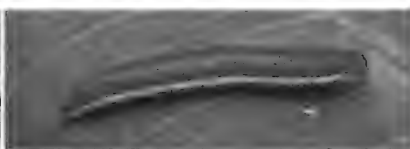
with torch in hand, I observed lots of feeding. Leaf chewing was easily audible, almost imitating the sound of light rain on the large leaves! If disturbed, large larvae may thrash around and drop to the ground.



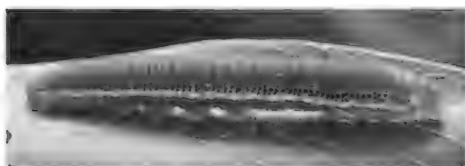
1st instar



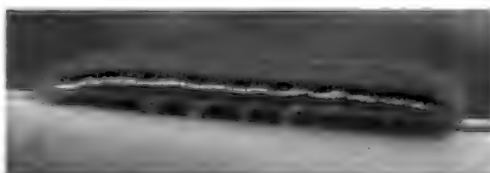
2nd instar



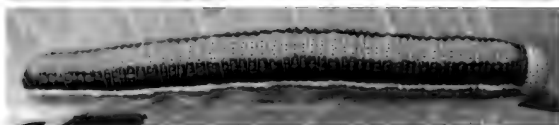
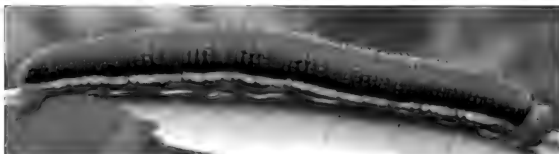
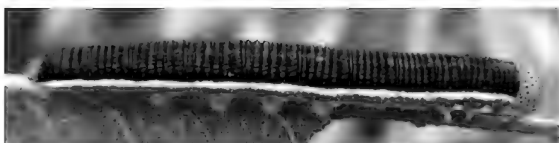
3rd instar



4th instar



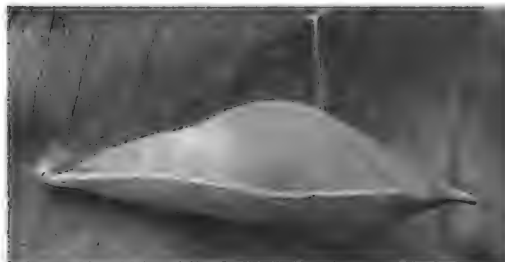
5th instar



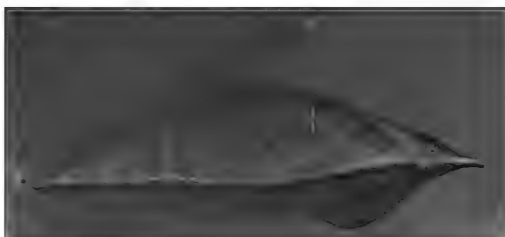
Images above: Final instar larval colour variations found on *Cassia fistula* February 2020

Image right: Larvae found in natural state on *Cassia fistula* February 2020





Green pupa



Light brown pupa



Pupa pre-emergence (pale form male)

The green coloured pupa (or occasionally light brown), measuring 33mm in length, was located below a leaf of the host plant. It was attached by the cremaster and a central silk girdle. Pupae may be found several metres away from the host on different plants if vegetation is entwined. I noted a pupa approximately 10 metres away from the host tree.

During February 2020, adults in captivity had emerged at various times of the morning. Some had emerged and were ready to fly by 5.30am, while others were still emerging up until 9.00am.

The total time from an egg laid 28/12/2005 to an adult emerging 18/01/2005 was 3 weeks, with egg duration 3 days, larval duration 10 days and pupal duration 8 days.

Eggs and small larvae were collected from fresh shoots of *C. fistula* in my garden in Beaudesert from early January until early February of 2020 and were raised in captivity. The

earliest adult emergence was 1st February while the final adult emerged on the 7th March. The following percentages resulted from the 209 adults raised; Dark form male 43 (20.6%), Dark form female 37 (17.7%), Pale form male 67 (32%) and Pale form female 62 (29.7%). Over this period of time both forms, male and female, emerged on the same days. The pale form was more common towards the latter days with several also emerging from the start. Adults of the dark form also emerged towards the end of this period. Also during this period, the dark form was found more commonly flying in the garden. Although all the above adults were raised in a similar fashion it resulted in higher numbers of the pale form than would be expected at this time of the year in this location.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane this species is very common during the summer months with adults being present throughout the year. It is less numerous in the early drier winter months. In this



location, under natural conditions, the pale form is most frequently observed during the early spring months, with the dark form being much more numerous in the summer months. There are probably up to four generations per year in this region, but may depend on rainfall and availability of fresh growth to trigger breeding.

I would like to thank John Moss for additional suggestions to the manuscript and supplying 2 images of a white pale form male.

Photos Wesley Jenkinson except where previously credited

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Notes on Host Plants for the Lemon Migrant, *Catopsilia pomona* (Fabricius, 1775) (Lepidoptera : Pieridae) as observed during the summer of 2020 – Peter Hendry

As many would have seen, this summer, with all its terrors on the fire front, provided us with some spectacular sights on the butterfly front. One being the spectacular number of Lemon Migrants (*Catopsilia pomona* (Fabricius, 1775)) on the wing. I have two specimens of the small exotic tree *Senna didymobotrya* growing in one of the few sunny spots in my yard. On one occasion, in early February, I stood and watched twenty plus females deposit eggs at the rate of one every one to three seconds. A conservative estimate of 4,000 eggs were laid in the ten minutes I stood and watched. While at other times of the day the activity was not so frantic, this has carried on to today (6/04/2020) with a few stragglers still laying eggs on both plants.

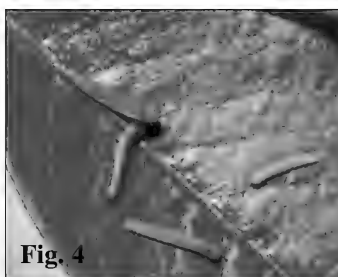
The irony is that the trees are not stripped of all foliage but are in fact fully leafed. Though *S. didymobotrya* consistently produces new leaves, all the older leaves remained virtually intact. During mid-February I started taking notice of this fact and took a closer look. I noticed several ants running up and down the stems, though not in large numbers and any removal by them remains unobserved, but they may account for a percentage of the eggs. Another observation was the fact that the leaflets



changed colour just under where the eggs were laid (Fig. 1 arrowed) and with older eggs became darker and darker (Figs 2 & 3). The eggs in figs 2 and 3 never hatched. I believe this represents some chemical defence



mechanism by the plant to protect itself. However, many eggs did hatch and a large number of first instar larvae were observed but here it basically ended. For about three weeks, before I left on an aborted two and half month trip, I started collecting eggs and first instar larvae. While some eggs hatched others did not and all the larvae died. I tried transferring several larvae to the more palatable *Cassia* sp. Paluma Range (Fig. 4) but with fatal results, they did not eat and passed away the next day (Fig. 5). The day before I left I found one second instar larva, the most advanced I had found. On my return, a fortnight later, there was no sign of anything other than eggs and first instar larvae and the only chewings were those of a first instar larva (Fig. 6) with no major damage to the trees.



I started questioning the original record of *S. didymobotrya* as a host for *C. pomona*. My research led me to an article by M.J. Manski, 1960 titled "Food Plants of some Queensland Lepidoptera" published in *The Queensland Naturalist* 16. In this article Manski stated he had *reared the Lepidoptera listed*, this was followed by a plant list with the lepidoptera that feed on them with no detail about any life histories. With regard to *S. didymobotrya* he stated that they feed on the flowers, and this may be the problem as, during this period, there have been no flowers on my plants. John Moss, who provided me with access to the article, informed me that several of the records in the article were in doubt or had been queried. In correspondence that has come across my desk John states *I believe that Joe Manski's 1960 comments that larvae of both C. pomona and C. pyranthe feed on (flowers of) Senna didymobotrya are based only on oviposition records in the former case and misidentification of the butterfly in the case of C. pyranthe. Also his assertion that C. pyranthe and what was then known as*



C. scylla gorgophone (now *C. gorgophone*) feed on *Cassia brewsteri* & *C. fistula* is also in error as he has misidentified these two species for pale forms of *C. pomona*. I also received from Kelvyn Dunn a copy of his 1995 article titled “Notes on the Biology and Wing Variation in *Catopsilia gorgophone gorgophone* (Boisduval)” published in the *Victorian Entomologist* 25 in which he calls into doubt some of Manski’s records and notes others that treated some of his records with caution.

While I cannot conclude that *S. didymobotrya* is not a host plant for *C. pomona* as no flowers were involved, I can say that possibly hundreds of thousands of eggs were laid for no result! Also it must be stated that the use of flowers as food is highly unusual for species of the butterfly family Pieridae and is more the reserve of the Lycaenidae, particularly the Pea Blues.

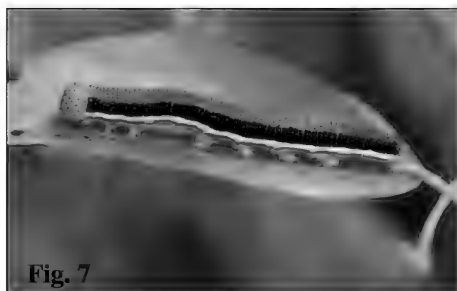


Fig. 7



Fig. 9



Fig. 8

Meanwhile, on an unrecorded date in late January, I observed a single female *C. pomona* laying eggs on a specimen of *Cassia* sp. Paluma Range, listed on the CD “A Garden on the Wing” by Garry & Nada Sankowsky and Lloyd Nielsen,

2002, as a host for the Lemon Migrant (*Catopsilia pomona*). About a fortnight later (14/02/2020) I found over a dozen last instar larvae on it and collected one (Fig. 7). It pupated (Fig. 8) on the 19/02/2020 and emerged as a pale form male (Fig. 9) on the 28/02/2020.

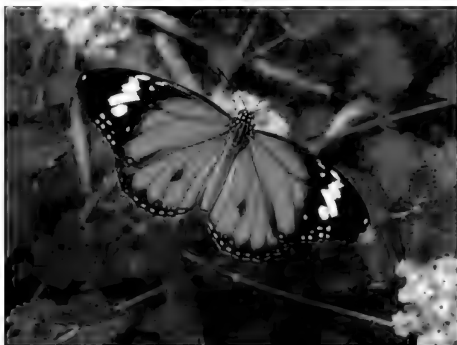
In conclusion, I cannot recommend *S. didymobotrya* as a host for *C. pomona*. However, in its favour, when it is in flower it is a great source of nectar for the Giant Carpenter Bees, *Xylocopa* spp.

Photos Peter Hendry



Notes on the life history of the Orange Tiger (*Danaus genutia alexis*) – Dennis Bell

The Orange Tiger (*Danaus genutia alexis*) is a butterfly found in the far north of Western Australia (Kimberly region) and the western side of the Northern Territory. It is commonest in the Kimberly region becoming more scarce in the Northern Territory and although recorded from Darwin it is rare in that location. The species is very widespread throughout S.E. Asia from Indonesia to India however the subspecies *D.g. alexis* is endemic to Australia. I have observed other subspecies in Asia (Nepal, Thailand and Malaysia) where they are common, widespread and also much larger butterflies than the Australian counterpart.



Orange Tiger (*D.g. alexis*) male



Orange Tiger (*D.g. alexis*) female



D.g. alexis male underside



Oxystelma esculentum

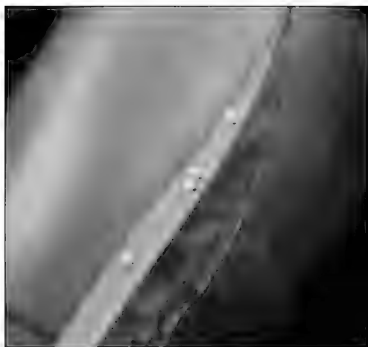
The restricted distribution of the Australian subspecies probably reflects the limited distribution of the only known larval food plant and a lack of alternative plants to use for their life cycle. In the wild the food plant is *Oxystelma esculentum* (previously known as *Sarcostemma esculentum*). This plant is common in wet areas on the Ord River but has a very restricted distribution in the Northern Territory with the Daly



River area the main location for the plant and butterfly. *D.g. alexis* is apparently unable to use any of the larval food plants normally used by other Danaids in the Northern Territory.

The butterfly tends to frequent shaded areas near watercourses particularly where the food plant grows as a vine twining up through *Typha* rushes on the waters edge. In these circumstances the butterfly flies weakly, landing frequently on the rushes. Away from these areas individuals adopt a more purposeful flight usually within 2 metres of the ground but will still land frequently.

They are very closely related to the widespread *Danaus petilia* which has a similar flight habit and flies in the same habitat but *D.g. alexis* is more distinctly orange and is a smaller butterfly. Both these species use *O. esculentum* as larval food plants. Larva collected from *O. esculentum* in the wild has to be carefully inspected to ensure its identity. Larva with a single pair of fleshy filaments on the front (metathorax) and rear of the larva are *D.g. alexis* rather than *D. petilia*.

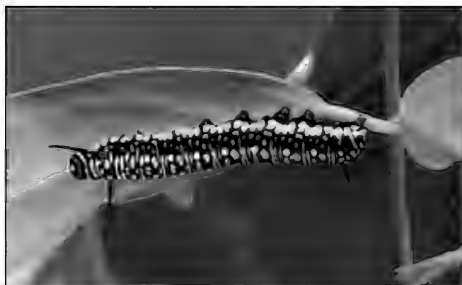


Eggs on *Oxystelma esculentum*

In captivity the butterfly will readily lay eggs on plants of *O. esculentum*. Almost all are laid on the underside of a leaf with the butterfly landing on the topside of the leaf and then curling its abdomen under the leaf to lay the egg. The eggs are white and elongated and hatch within 4-5 days during the summer.

Newly hatched larva are initially white but develop colour rapidly. After eating their own eggshell, they usually start eating the leaf close to where the egg was, either eating from the leaf edge or creating a hole in the leaf. They usually then move to the tip of the leaf to feed. Freshly emerged larva prefer to have a leaf to themselves and will eat other eggs on the leaf.

All the larva raised were generally consistent in colouration. Final instar larva have a black body with each segment having 3 to 4 white transverse dorsal bands and a pair



Final instar larva of *D.g. alexis*



of bright yellow dots. The dorsal white bands are reduced to dots on the sides of the larva and in some larva are reduced to dots even on the top of the larva. Each segment also contains two large yellow markings on the sides which, in darker specimens, can split into four dots. The mesothorax and abdominal segment 8 both have a pair of fleshy filaments which are black with a pink base. The filament pair on the mesothorax is the longer of the two and usually point forwards in the final instar.

Meyer has reported on wild populations and found that the larva are variable in base colour (beige, maroon and black) and occasionally possess a very small third set of filaments on abdominal segment 2. However all the specimens he raised were dark form larva.

Larva develop rapidly, and after 10 days the larva (approx. 30mm long) are ready to pupate. Larva will travel considerable distances when looking for a suitable pupation site. Pupation is rapid and usually occurs overnight. The pupa are 13-15mm long and are variable in colour. Most are cream with varying degrees of pink but some are green in colour.



Pupa – pink form



Pupa – green form

Pupa hatch after 7 days with the adult butterfly hanging onto the empty pupal case to dry. Adult butterflies adapt to shade house conditions but do prefer sunshine for them to be active. They are most active early in the morning and late in the afternoon.

It has been reported (Ackery and Vane-Wright, 1984) that the Asian *D. genutia* will also use various *Asclepiadaceae* as larval food plants including *Stephanotis*, *Asclepias*, *Tylophora*, *Raphistemma* and *Cynanchum*. Consequently, *Stephanotis floribunda*, *Tylophora flexuosa*, *Asclepias curassavica*, *Gomphocarpus physocarpus*, *Cynanchum ovalifolium* and *Cynanchum pedunculatum* were tested. However in almost all cases the butterflies refused to lay eggs on these plants and the larva refused to eat any leaves of these species.

Only *Cynanchum ovalifolium* was successful, with the butterflies readily laying eggs on this plant, and the larva readily eating the leaves. Freshly hatched larva need soft young growth, however larger larva are capable of eating all leaves. The known distributions of this plant and *D.g. alexis* do not overlap so is not used in the wild. In the Northern Territory this plant is only recorded from Arnhem Land, however it is relatively common on Cape York where the Swamp Tiger (*Danaus affinis*) uses it as a larval food plant (Sankowsky, 1991).



This finding does indicate that the Australian subspecies is capable of utilising other plants rather than *Oxystelma* as larval food plants although in a much more limited extent to the Asian subspecies. It is of interest that the butterfly has been found at Mataranka, a considerable distance from the Kimberly region or mouth of the Daly River. If this is a local, rather than a transient, population it is possible that it is utilising an alternative food plant to *O. esculentum*.

Note on Host Plants

C. ovalifolium is a medium sized vine that naturally occurs in rainforest on Cape York peninsula. Despite its tropical origins, I have found that growing *C. ovalifolium* is fairly straightforward and it is readily propagated from either seed or cuttings. Over summer it will grow readily given fertiliser and water, while during winter (Brisbane) growth slows but the plant shows no pronounced cold sensitivity. It readily flowers and produces large pods containing many seeds which readily germinate.



Cynanchum ovalifolium

O. esculentum is a small vine found mainly in the Kimberly region of Western Australia and to a limited extent the Northern Territory. Being a plant of the waters edge it is somewhat more difficult to grow than *C. ovalifolium* but growth can be surprisingly rapid during the summer months if kept wet. During winter, growth is slow but the plant can be successfully maintained in Brisbane. Propagation is best carried out from cuttings or runners during summer.

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Photos Dennis Bell

Lawn Grubs or Bernie Makes a Mistake — *Bernie Franzmann*

A few years ago, a friend told me that those brown fluffy patches on the eaves of the house are the eggs of a moth that is a lawn pest and that I should brush them off. I felt I had to correct him and explained that they were the eggs of a cluster caterpillar (*Spodoptera litura*) and the caterpillars of this moth attack many vegetable plants, such as cabbages, strawberries and tomatoes but not lawns.





Lawn Armyworm moth
(Wikimedia – Donald Hobern)



Eggs of *S. mauritia*

However, some months later, I discovered that he was right. They were the eggs of another species of *Spodoptera* (*S. mauritia*) known as the Lawn Armyworm. The Lawn Armyworm is indeed a pest of lawns in the Brisbane area.

Yes, OK, OK, I did humbly acknowledge to him that I had made a mistake.

How could I have been so wrong?

When I was studying entomology, many years ago, I am sure I was taught that **THE** moth pest of lawns in Brisbane was *Herpetogramma licarsialis* – known as the Grass Caterpillar, the Grass Webworm or the Sod Webworm, and they didn't lay fluff-covered eggs. I don't remember hearing of any other moth lawn pests.



Grass Caterpillar moth

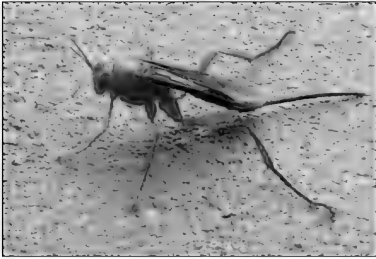
The lawns of Brisbane and nearby areas have been under attack from both these pests during the past few months: so many that it has been on the news. The caterpillars are very hard to find as they feed at night and get close to the ground during the day. If you wanted to check if they were attacking the lawn, the old advice was to put down a hessian bag overnight,

and in the morning you could see the caterpillars under the bag. Hessian bags don't seem to be very common these days, so I put down an old bath towel one night and found 14 caterpillars under it the next morning!

When the caterpillars are fully grown, they pupate on, or in, the soil and so ultimately the lawn damage ceases and the lawn regrows.

A very common parasite of both species is the orange and black wasp (*Lissopimpla excelsa*). They can often be seen flying over the lawn in search of caterpillars. They insert an egg into a suitable caterpillar and their larva feeds on the inside of the caterpillar. The wasp larva does not kill the caterpillar until it pupates so they have no effect on the damage to the lawn, but, in effect, simply reduces the number of pest moths emerging.





Orchid Dupe

An interesting anecdote about *L. excelsa*: it is known as the Orchid Dupe, because males pollinate members of the orchid genus *Cryptostylis*. The wasp mistakes the flower parts for a female wasp and attempts to mate with it and so transfers pollen! Maybe this could be the subject of another article?

Anyway, back to my mistake. Could I not be forgiven? What are those moths thinking, laying where they do?

When the tiny caterpillars hatch, they have to abseil about three meters to the ground, on a silken thread that comes from their mouths. After that, at my house, they have to cross two meters of concrete to get to lawns. Their mothers don't seem to be very caring.

Photos Bernie Franzmann except where previously credited

Poinciana Looper (*Pericyma cruegeri*) – Ross Kendall

Issue No. 59 of this magazine in December 2010 carried an article by Peter Hendry about the Gum-leaf Skeletonizer (*Uraba lugens*) the larvae of which were first noticed in September as they stripped the leaves of thousands of Narrow-leaved Ironbarks (*Eucalyptus crebra*) in the Gatton/Laidley region west of Brisbane. Now it is the turn of the Poinciana (*Delonix regia*), an attractive exotic tree which originated in Madagascar, to feed millions of larvae of the Poinciana Looper Moth (*Pericyma cruegeri*) in our area.

I first noticed larval frass on the ground under a Poinciana in my street in mid-March and an examination of the foliage led to the discovery of numerous larvae. A check on a dozen trees within a radius of 500 metres confirmed the presence of thousands of larvae. These trees were soon only poor relics of their lush selves only weeks earlier.



Larva of Poinciana Looper Moth



Defoliated Poinciana tree



Several members of the club's Facebook group have confirmed a similar situation in their areas across South-east Queensland.

Having sent a larval image to our moth guru, Peter Hendry, I soon had an identification. For the technically minded, please see Peter's notes below.

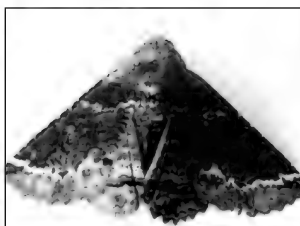
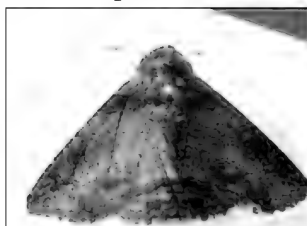


An odd place to pupate!
Photo Dominic Frost

The larvae are quite active and will cast themselves off the plants readily. When ready to pupate, they drop to the ground and look for a handy nook to spin a cocoon and pupate. Last instar larvae were around 50mm in length. Pupae are 12mm in length. Specimens that I reared had a pupal duration of around twelve days. Adults have a wingspan of around 35mm and the colour of the upper side of the wings varies from shades of brown through to blue-grey.

These moths certainly cap off what has been a prolific first three months of 2020 for both butterflies and moths after a lengthy period of drought.

Some examples of moth colour variations



Photos Ross Kendall
except where
previously credited

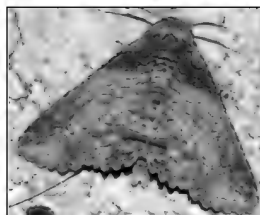
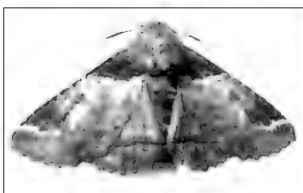


Photo Greg Tasney

Notes from Peter –

Pericyma cruegeri was named by Arthur Gardiner Butler, an English entomologist, arachnologist and ornithologist, in an article titled "Descriptions of 21 new genera and 103 new species of Lepidoptera-Heterocera from the Australian Region", published in the Transactions of the Entomological Society of London 1886, from a specimen



collected at Gayndah, Queensland. Butler named the species under the genus Homoptera (a name now used for a suborder of sucking insects) and gave the “Expanse of wings” as 48mm.

Pericyma cruegeri now resides in the superfamily Noctuoidea, family Erebiidae, subfamily Erebinae, tribe Pericymini. Several forms have been described, 2 by Strand in 1916 and 3 by Hulstaert in 1924, alluding to the variability of this species. According to the Pacific Pests and Pathogens - Fact Sheets, it has been recorded from, Southeast Asia, Hawaii, Oceania, Micronesia, Guam, Northern Mariana Islands, Palau, Papua New Guinea, and Tonga.

References:

Hulstaert, R. P. G., 1924, *The Annals and Magazine of Natural History* series 9 v13 p120
Pacific Pests and Pathogens - Fact Sheets on line at:
https://apps.lucidcentral.org/ppp/text/web_full/entities/poinciana_looper_moth_251.htm

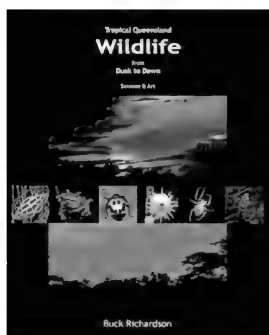
Strand, E., 1916, Neue Aberrationen der Noctuiden-Subfamilien Hadeninae, Erastrinae, Catocalinae, Mominae und Phytometrinae. *Archiv für Naturgeschichte* Bd82:Heft1-4

Leps in books: lights under bushels, two overlooked books –

Roger Kitching

In this second article on books about Lepidoptera I shall discuss two overlooked books – overlooked for quite different reasons, but overlooked nevertheless. Before I begin, however, I must apologize to readers of the first article in this sequence and the shade of Ebbe Schmidt Nielsen for forgetting that ancient mantra ‘i before e except after c’ – this applies just as much to the names of deceased Danish-Australian lepidopterists as it does in the English language in general – *mea culpa*.

So back to the overlooked works. These are Buck Richardson’s splendid volume ‘*Tropical Queensland Wildlife from Dawn to Dusk*’ (LeapFrogOz Kreations,



Kuranda, 2015) and Jeremy Holloway’s seminal volume ‘*Moths of Borneo Part 2*’ (first appearing as *Malaysian Nature Journal* **63**, 1-548; subsequently published and available from Southdene Sdn Bhn, Kuala Lumpur). Both are important to Queensland-based moth enthusiasts for different reasons, *and* there is a tenuous connection between them.

Tropical Queensland Wildlife from Dawn to Dusk is a beautifully produced, large format volume that, in spite of its title, is principally about moths of the Queensland tropics. This is Buck Richardson’s second volume on the



fauna of his home district: the Atherton Tablelands of Far North Queensland. The first, neologically titled *Mothology: Discover the Magic*, was published in 2008 and reviewed by Peter Hendry and Lois Hughes in *Metamorphosis Australia* of December 2008. That book presented photographs of more than 370 species of adult moths from the Kuranda district but, and what made the work unique, these were complemented by pictures of art-works – prints, globes, polyhedrons, discs – coloured and patterned from moth images – or parts thereof. The natural moth portraits were all labelled and, as far as possible, correctly identified. *Mothology* is an A4 sized work, bound lengthwise and comprising just 66 pages. It was acclaimed by its couple of reviewers and remains itself, a unique piece of scientifically useful artwork.

Tropical Queensland Wildlife from Dawn to Dusk, Richardson's second work, is a similar combination of science and art but created on a much larger scale. By far the greater part, 203 of the 348 pages is devoted to superb photographs of adult moths and butterflies (mostly moths, this being a book on the night fauna of the region). These are interspersed with 27 Lepidoptera-derived artworks. The remainder of the book is a similar combination of scientifically useful portraits of nocturnal animals (plus a few plants) interleaved with artwork derived from the biological images. The scientific images are gathered by family and genus and, as with *Mothology*, have accurate scientific and common names (where available) attached. From a lepidopterist's viewpoint the book is immensely useful for identification by comparison: it illustrates 1125 different species of moths and 36 species of butterflies across all families. Add to this 67 Coleoptera, 53 Hemiptera, 61 Orthoptera, 82 other invertebrates, 37 vertebrates and 6 flowers, and both the range and sheer scholarship of the work is evident.

The artwork in both of Richardson's books is extraordinary: computer-created, it brings Maurits Escher's drawings to mind, without the perspective-twisting preciousness of Escher's drawings. Richardson's art is, for me anyway, more intrinsically beautiful and certainly more colourful than that of Escher.

Richardson's second book ends with a surprise – for the scientist at least. The author completes the work with a five-page essay that he calls 'The Language of Science'. This is a thoughtful and provocative challenge to popular science writers, especially when talking of the processes of evolution. The author sees, even in the 'best' of popular writing on evolution, a use of language that is often anthropomorphic, frequently implies 'improvement' (thereby suggesting both a 'goal' and the idea of 'progress'), and/or suggests a sort of intent on the part of the organisms that are evolving. Richardson is in no sense challenging the ideas of evolution as understood by modern science but he does find that popularizing scientists get tangled in their own metaphors while trying to explain the complexities of evolutionary theory and examples. He also criticizes researchers for selecting one feature of a species (such as its resemblance to another species) for investigation while being aware that it is the entire phenotype that is leaving more or fewer genes across generations. It's hard to



disagree with what he says but, speaking as a teacher and sometime popularizer, it is very hard to get across the basic principles of evolution without using linguistic tools such as metaphor and simplification. But, based on Richardson's comments, I for one will definitely try harder.

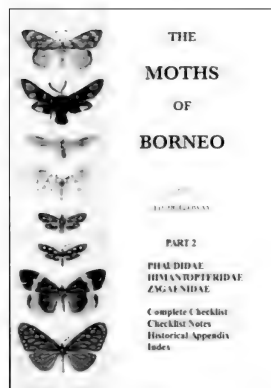
Tropical Queensland Wildlife from Dawn to Dusk was not widely reviewed. The positive comments made by Dr Geoff Monteith at the launch of the book in Cairns were reprinted in *Metamorphosis Australia* #82 in 2016 and are also to be found on the Richardson website, but that is all I can find. The work is, in fact one of the great regional Lepidoptera guides – and should be recognized as such.

Richardson is assiduous in obtaining and verifying accurate names for his subject matter. When organizing his species into families, however, he follows earlier Australian reference works (Common 1990; Nielsen, Edwards & Rangsi 1996) in using what is now a superseded classification of the Noctuoidea – which is where the second book comes to mind.

Jeremy Holloway's *Moths of Borneo Part 2* was published in 2011 as the last published of 18 parts of his masterwork *Moths of Borneo* which appeared in 17 volumes (one contained two parts) published from 1986 onwards as a joint effort by the Malayan Nature Society and Southdene Publishing, Kuala Lumpur. All but three of these volumes appeared first as parts of the *Malayan Nature Journal*. With the appearance of Part 2 in 2011, Holloway had completed a guide to all species of macro-moths (4630 species in 26 families) known from the immense tropical island of Borneo (except the Lacturidae which were only formally described by Heppner in 1995). Along the way he described dozens of

new species, reassessed the status of moth families, subfamilies and tribes and, generally, produced works of a global significance far beyond a 'simple' identification guide to the moths of Borneo. A conspectus of his views on what is called the higher classification of the Lepidoptera appeared in another seminal work, *The Families of Malesian Moths and Butterflies* that he produced, with two co-authors, in 2001.

So, before I discuss the book itself, give a thought to the purposes and principles of higher classification. When Linnaeus codified the hierarchical classification of organisms – classes, orders, families etc. – he based decisions on similarities among species and judgment of what features of organisms were more or less important. Indeed, at one stage, he was accused of an over-obsession with the sexual parts of flowers in his ordering of the plant kingdom (Blunt, 1971). This similarity and judgment-based approach was challenged when Darwin and Wallaces' theory of evolution became mainstream. Classifiers still used the same hierarchical approach



but now, in principle, wished each grouping of species to reflect common decent (that is: each family, order, class etc., somewhere in prehistory, ‘should’ have had a single ancestor species). This so-called cladistic approach to classification persists. Until the 1990’s though, this approach, too, was based on judgments and statistical similarities sometimes with particular characters being given more weight than others but, in all cases, reflecting subjective choices about what anatomical (and other) features should be included. For the Lepidoptera, the presence or absence of key structures (such as a thoracic tympanum – the defining feature of the Noctuoidea), arrangement of veins in the wings, and male genitalia are examples of structures that were given more weighting than, for example, colour or wing shape.

All of this changed in the 1990’s when relatively straightforward genome-based characterization of insect species became possible. If enough genetic material was collected from enough species within a group then, in principle, measures of similarity derived from them MUST represent the evolutionary history and connections of the species included in the analysis. This means that over the last few years we have seen the emergence of more and more genome-based trees of descent which, for multi-celled organisms like the insects, attempt to be the last word on who’s related to whom. A few of these studies have proceeded to the next logical step which is to revise the higher taxonomy of the organisms which they studied based on the outcomes of their genetic analyses. This is what Zahiri and his colleagues (including Jeremy Holloway) did in their ground-breaking paper on the Noctuoidea in 2011. This revolutionized the way we look at the huge number of species of noctuid moths: it reduced ‘families’ like the very well-known Arctiidae and Lymantriidae to mere sub-families (which thereby became the Arctiinae and Lymantriinae); it split the Noctuidae into two – the Erebidae and a much smaller version of ‘Noctuidae’ (subsequently referred to as (Noctuidae ‘*sensu stricto*’ or just ‘*s.s.*’); and, it organized hundreds of genera and species into ‘new’ sub-families based on the molecular trees.

And so back to *Moth of Borneo* Part 2. As part of the coverage of all the larger moths of Borneo Part 2 covers three relatively small families within the superfamily, the Zygaenoidea: the Phaudidae, Himantopteridae and Zygaenidae. These are particularly interesting groups including, as they do day-flying moths and some remarkable mimics of unrelated species. These formal accounts, however, fill just 80 pages of this 548-page tome. The remainder revisits all the previous volumes with a complete checklist, addenda and so on. Most important in the present context, however, is the section that takes the previously described genera and re-positions them in their higher taxa together with the appropriate trees of descent showing what is related to what. This produces dramatic changes in the Noctuoidea and follows the Zahiri *et al.* results. Here, Holloway describes the six families now accepted within the superfamily and lists the genera that belong within each grouping. The six families are the Oenosandridae (an exclusively Australian group consisting of eight species organized into four genera), the Notodontidae (with five subfamilies included), the Erebidae (with no fewer than 17 subfamilies), the Nolidae (with seven subfamilies),



the Euteliidae (2 subfamilies) and the much reduced Noctuidae (with 12 or 13 ‘surviving’ subfamilies). All of these families and a large number of the Bornean genera described also occur in Australia. So, for me, this is the go-to reference when I wish to translate names from the ‘old’ classification (as in the Nielsen, Edwards and Rangsi, 1996, *Checklist*, for example). Alternatively, of course, you can simply Google the names and hope for the best in terms of accuracy and currency – but Holloway not only is one of the authorities that helped drive this taxonomic revolution, he also justifies his rearrangements and puts them in the context of the larger grouping which is the whole superfamily, the mighty Noctuoidea.

Both of these volumes deserve to be better known. Fortunately both are still available at affordable prices – the Richardson volume via the website www.leapfrogoz.com and the Holloway volume from specialist booksellers.

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REPORT

Tamborine Mountain excursion, 14 March 2020 – Peter Storer

One of the joys of an excursion such as this is the drive to the destination (once you get off the freeway) as you wind your way up the mountain through the various forest types.

By about 10 am, about 25 enthusiastic BOIC or family members had gathered at Richard and Betty Bull’s home for a scrumptious morning tea. Most of us took the opportunity to venture across the road where there were two lookouts over the Gold Coast and a meandering trail through the rainforest. No adult birdwings showed up, so, after a short briefing on the proceedings for the day, we headed in convoy a few kilometres to the Shelf Regeneration Project to see the wonderful revegetation efforts by Tamborine Mountain Landcare. We parked along the roadside, some in more



precipitous positions than others. We were then briefed on the scope of the project by Judit (not a misspelling, European name) Roland.



Judit Roland briefing us on the fabulous revegetation work at the Shelf

grabbed our attention was laden with black fruit all along the branches: it was a Black Plum (*Diospyros australis*), which indeed is edible when fully ripe. Further down the hill someone spotted a Brush Mistletoe (*Amylotheca dictyophleba*), which is the host for the Trident Pencilled-blue (*Candalides margarita*).

Next stop was the Landcare headquarters where we saw yet more wonderful revegetation, including a large planting of Birdwing Vines (*Pararistolochia praevenosa*). There was great excitement when someone proclaimed they had found a Richmond Birdwing caterpillar: the first sighting of our target species for the day, albeit a larva. Shortly afterwards some of us were lucky enough to see a female Birdwing fly high across the carpark, but others remained sceptical (a case of Birdwing envy?).



These trellises at Tamborine Primary School are used to grow Birdwing vines

Perhaps surprisingly in a place like Tamborine, the majority of the work carried out over the past 3 years had been by paid contractors, not local volunteers. The track down into the plantings was fairly steep, and in places muddy, so it was slow going, with a few butterflies as distractions [Wanderer (*Danaus plexippus*), Lesser Wanderer (*Danaus petilia*) and Common Eggfly (*Hypolimnna bolina*)], but sadly no birdwings. The growth rate of the trees was impressive. One small tree that

The final stop for the convoy on a busy morning was the Tamborine Mountain Primary School, where Landcare volunteers had planted an impressive number of vines along a series of trellises next to a rainforest remnant as an educational project for the students. Yet again the adult Birdwings proved elusive.

We then headed to Main Street where most of the group had a delicious lunch at the Spice of Life Cafe, at which

Richard Bull was clearly a regular local patron.



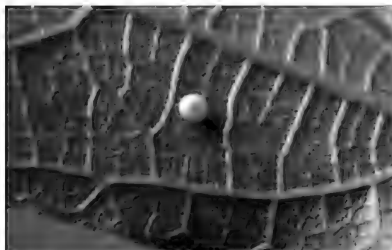
Our final destination was the extremely well-tended garden of Geoff and Christine Atherton. The majority of the block comprised much-loved formal gardens, including a colourful flower garden that attracted many butterfly species. The Athertons had also undertaken extensive rainforest revegetation along a magical stretch of Cedar Creek that runs through part of the property.

One of the paths to the rainforest was bordered by some very well-established Birdwing vines and our members soon spotted eggs and various instars of caterpillars. Sadly, the adults proved largely elusive, although we did get glimpses of a male flying high over the garden just before we departed.



BOIC members enjoying the shade along Cedar Creek at the Atherton garden

Egg, first, second, third and fifth instar caterpillars of Richmond Birdwing
(*Ornithoptera richmondia*)

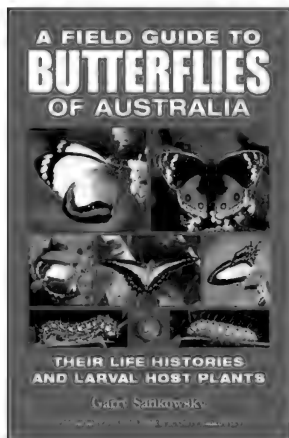


Thanks to Dawn, David, Ian and Judy, Richard and Betty, Geoff and Christine, Ross, Judit and everyone else involved in making this such an enjoyable day out.

Photos Peter Storer



A Field Guide to Butterflies of Australia, Their Life Histories and Larval Host Plants by Garry Sankowsky – reviewed by Peter Hendry



The book starts with acknowledgements and photographic credits, followed by the contents and introduction. There is then an explanation of scientific terms, abbreviations and common names used. Some notes on photographing butterflies are then given, before the main body of the work begins with an introduction to the Swallowtails. Each section has similar introductory pages. The layout of the book has up to three species per page while one species, *Cressida cressida*, is spread over six pages, five of which are dedicated to host plants.

As pointed out in the introduction, this book differs from other field guides in that all the butterflies illustrated are of live specimens and, unlike other field books, it illustrates life cycles and host plants. The

author refers the reader to his previous work of 2016, *All About Butterflies of Australia*, to achieve an overall view of what butterflies are about as information in that book is not repeated in this one.

This work is chiefly a photographic one that illustrates 363 of the 408 mainland and Tasmanian species as well as several subspecies. All of these have at least one adult image, the wingspan, and the distribution noted along with a distribution map. There are 48 with full life cycles (egg, larva, pupa and adult); 42 with the full lifecycle as well as images of host plants. 50 species have their eggs illustrated; 155 their larva and 152 their pupa. The host plants for 350 species are noted and 213 species are illustrated with one or more of their host plants. If a species is noted without host plants, it is either because they are unknown or the larvae do not eat plants.

One of the great features of this work is the author's recommendations under the heading "Best Garden Host Plant". There are 235 of these throughout the text. Where only one or two host plants are known, no recommendation is given. In some cases the author also notes the best situation to plant the host species, e.g. full sun, part shade, etc. This is a very useful tool for the butterfly gardener with limited space, hoping for the best outcomes.

The last chapter is a wonderful piece on cultivating mistletoes. This is followed by the index, references, and a list of contacts for further information including how to identify host plants.

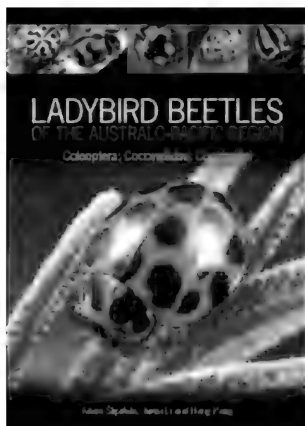


While most works do not go unscathed, without some oversights or discrepancies, this is no exception. Though only minor, I found the Lesser Wanderer on its main page is given the correct current scientific name of *Danaus petilia*, while on the following page, covering some of its host plants, the older scientific name *Danaus chrysippus* is used. This is carried through to the index which references both. Another use of an older scientific name was the Blue Triangle referred to as *Graphium sarpedon*. It is now known as *Graphium choredon*. At the bottom of page 16 the male Richmond Birdwing is illustrated with a female sex symbol. A small criticism could be aimed at some of the images being printed too small, and a few are a tad dark.

This A5 sized, 400 page book comes complete with colour coded sections and a plastic protective cover. It is a wonderful work not only useful as a pictorial field guide but very useful to the butterfly gardener and is a bargain for the price.

The book is available from BOIC, <http://boic.org.au/index.html?page=/html/booksale.html>, for \$45 for non-members and \$40 for club members, plus postage.

Ladybird Beetles of the Australo-Pacific Region – Coleoptera: Coccinellidae: Coccinellini by Adam Slipinski, Jiahui Li, Hong Pang – reviewed by Bernie Franzmann



As the authors state “The ladybirds are iconic beetles that we are all familiar with since our childhoods, having observed colourful beetles wandering on leaves and flowers and feeding on aphids on plants in our gardens.”

To produce this book, the authors examined more than 10 000 specimens.

The genera and species of the Australo-Pacific Coccinellini (Coleoptera: Coccinellidae: Coccinellinae) are reviewed. In the region there are 95 species. All species are described and illustrated and keys to their identification are provided. If I added up correctly there are about 40 species in Australia.

There are 103 pages describing each species, its biology (if known) and geographical distribution.

There are 36 coloured plates of adults and larvae in their natural habitats and 95 coloured plates showing the general pattern, colour, etc and pertinent taxonomic characters. These characters generally include some ventral abdominal characters and male and female genitalia.



To simplify things somewhat, an additional key to the Australian species of Coccinellini, based on external characters, is also provided.

Not surprisingly, I went looking for some of the ladybirds I was particularly interested in. I found most of them but was puzzled when I couldn't find the following. I discovered that they are in different Tribes; not the Tribe Coccinellini.

Rodolia cardinalis is a famous Australian ladybird, introduced into California in 1888, to combat the devastating citrus pest, cottony cushion scale. It is the first documented example of a successful biological control, by the introduction of an exotic predator. However, it is in the Tribe Novini.

Cryptolaemus montrouzieri, the well-known mealybug predator, and *Stethorus* spp. also well-known spider mite predators, are both in the Tribe Coccidulini.

The leaf-eating ladybirds, such as the Twenty eight-spotted ladybird *Henosepilachna vigintioctopunctata*, often seen in the vegetable garden, are in the Tribe Epilachnini.

This is a comprehensive, up-to-date book, beautifully produced. Persons, whose role it is to correctly identify insect specimens, will find it invaluable.

However, if you just like ladybirds (and who doesn't) and would like to know more about them, or maybe identify one found in the garden, this book may not be for you.

The book is available for \$220.00 from CSIRO Publishing

<https://www.publish.csiro.au/books/howtoorder>

PRESIDENT'S REPORT FOR 2020 AGM

The past year has been one of notable successes for the club with many of our activities covered in the last four editions of our magazine so I will not enter into details about them here. It has been very encouraging to have a number of younger people become members.

I wish to acknowledge the support of all of our committee members.

Richard has continued to be a steady, knowledgeable rock who is always there when needed.

Similarly, Rob, as an original founding member of the club in 1994, is always there with his quiet, charitable wisdom. He has held the position of Treasurer since its founding and continues to maintain our financial records in a professional way.

Daphne became a member in June 1995 and soon after that began editing and producing our original newsletter. Since its name change in 2008, she has continued to produce the club's quarterly news magazine "Metamorphosis Australia". The March 2020 edition was number 96 and we look forward to Daphne scoring her century next year. Her courteous, professional links with publishers and writers, her positive interaction with contributors and club members and her skills in organising the layout of our magazine definitely enhance the club's reputation.



Dawn has proven to be a major contributor to our success in the past year. Her organisational ability is outstanding. All of our activities bear Dawn's stamp. You will all have seen a number of "flyers" sent out. These were the result of lots of behind the scenes contact with potential guest speakers, venue bookings and committee members. Her communication with like-minded groups has led to increased respect and interaction. Thinking back, we must acknowledge Dawn's actions which have resulted in the design and production of both our main banner and our pop-up banner, the polo shirts bearing our logo, detailed planning for successful meetings and events and very significant increases in member interest and attendance at our functions. Then there are those welcome letters to new members, prepared agendas and detailed minutes of our meetings. Dawn actively helps manage the club's Facebook group which currently has a membership of over 500.

John joined the club in 1995 soon after its formation and served as our vice-president from 1996 until 2016. He has decided to "retire" from committee membership. With his extensive knowledge of plants and invertebrates, John has led many field trips, written numerous articles for the newsletter/magazine and has helped maintain scientific accuracy of many articles submitted by contributors. In the club's early years, John took up the earlier work of others in making a list of butterfly host plants, subsequently compiling the observations/records of many others and adding the extensive number of records that he has made himself. The product has been the well-received club publication "The Butterfly Host Plants of Southeast Queensland and Northern New South Wales" with the latest expanded 4th edition being released in April 2019. In 2006 John and I teamed up to produce a small pamphlet on the mistletoes found around Brisbane. It grew in scope. Ten years later, in April 2016, the club published the 134-page book "The Mistletoes of Subtropical Queensland, New South Wales and Victoria". It has been well received as a definitive reference and a "good read". I know that John will continue to share his expertise with us and the several other community groups of which he is a valued member.

David keeps us all on our toes with his enthusiasm and ideas and active participation in all of our functions. The concept and production of our name badges is a result of David's energetic thoughts. He continues to be a great help towards setting up and tidying up at our meetings and also provides a reliable and constant presence in assisting Dawn with her projects.

I hesitate to name others as, not being infallible, I may miss someone, but I wish to thank and acknowledge the active support of Christine and Geoff Atherton, Ian Buddle, Judy Burgess, Russel Denton, Ian and Judy Ferrier, Bernie Franzmann, James Hansen, Peter Hendry, Ian and Judy Lovelock, Morag McKinnon, Chris Sanderson, Garry Sankowsky, Darren Shepherd, Peter Storer, Denis Taylor, and Maurie Tucker. Each quarter, I express the gratitude we have for the many people who write for our magazine. I **will** single out Wesley Jenkinson who has submitted around 50 "Life History" articles - a truly heroic achievement. Thank you all again.



The Corona virus has forced us all to cancel or suspend club social activities and you are aware that we have had to meet our constitutional obligations by conducting a ballot for committee membership positions by email and snail mail. Thanks to all who participated.

Also, due to the pandemic the World Science Festival which was to be held in March in Brisbane was cancelled. This was disappointing for BOIC as we had been successful in being awarded a highly sought-after activity space at the City of Science weekend 28 & 29 March. We had invited both the Entomological Society of Queensland and the Australian Native Bee Association to partner with us for this weekend. The three groups designed a concept and were working towards our final display when it became apparent that we had a duty of care to our members and withdrew just before the official announcement of the event's cancellation. During, the past year we have worked with and built up our relationship with many like-minded community groups and in particular the Entomological Society of Queensland (ESQ) and the Australian Entomological Society (AES). This collaboration has been very beneficial. BOIC was granted a display at the annual AES conference held at the Brisbane Convention Centre in early December. BOIC organised the AES pre-conference bus trip to the Bribie Island Butterfly House. A couple of years ago, Geoff Monteith from ESQ organised the production a colourful poster describing the activities of BOIC for their use at festival displays. Geoff kindly displayed our poster amongst the AES Conference poster display. Thank you, Geoff. Delegates from other States were amazingly pleased to see the interaction between our community group and the professional bodies. One comment was "It just doesn't happen in our State!"

We will get through this virus issue and resume full activities in due course. Best wishes to all.

SEED BANK

There are small quantities of each of the following host plant seeds available. If you require any of them, please send a stamped, self-addressed envelope to Daphne Bowden, 24 Rickston Street, Manly West Qld. 4179 and list which seeds you require. Please keep in mind that, for the Seed Bank to operate, we need deposits as well as withdrawals.

<i>Alternanthera denticulata</i>	<i>Hygrophila angustifolia</i>
<i>Aristolochia acuminata</i> (Tagala)	<i>Melicope elleryana</i>
<i>Aristolochia macroura</i>	<i>Pararistolochia praevanosa</i>
<i>Asclepias curassavica</i>	<i>Senna acclinis</i>
<i>Asystasia gangetica</i>	<i>Senna gaudichaudii</i>
<i>Brachychiton populneus</i>	<i>Sesbania cannabina</i>

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

To be advised



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions, and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGEMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Todd Burrows who provided the cover photo
- Daphne Bowden who works on layout, production, and distribution
- Peter Hendry, John Moss, and Ross Kendall for scientific referencing and proof-reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Annual membership fees are \$30.00 for individuals, schools, and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname.

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